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POISON GAS ON THE FARM: SOME PROBLEMS OF THE VETERINARY PRACTITIONER*

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There are too many amongst us who by word and deed try to spread the gospel that gas will never be used by the enemy—a gospel which I regret to say is based on ignorance. Just as it is necessary to organise fire watching parties on a wide scale in order to combat the incendiary bomb menace, so we are determined that if gas is used *we shall be prepared*. Therefore I congratulate your Council on choosing such a subject for discussion to-day. Like members of every other profession who may be confronted with gas problems, the veterinary practitioner should—nay *must*—realise the difficulties he may have to face, decide how he will tackle them, know the intricacies of the organisations which have been set up to help him and finally make all his preparations *now*, so that if the rattles of the wardens should call him into action he will not be found wanting but will be ready to play his part in the important work of preventing food wastage.

[Dr. Stewart then briefly outlined the simple chemistry of the commoner war gases and the physiological effects produced in human beings.

He discussed also the organisation set up by the Ministry of Home Security for the quick detection of the gases should they be used, then commented on the usefulness of the warden, gas identification and advisory laboratory service. He showed that gases could be detected by three methods :—(*a*) smell, (*b*) clinical symptoms, and (*c*) chemical tests.

With the aid of a laboratory assistant dressed in the full light anti-gas clothing, Dr. Stewart demonstrated the various points which should be attended to in wearing such clothing and the necessity for such clothing being worn by all veterinary practitioners attending livestock contaminated by war gas.]

Most of our knowledge regarding the effects of war gases on livestock is based on analogy to their effects on human beings. If any information is available from recent research work on animals very little has been allowed to filter into scientific journals. Our knowledge regarding war gases was garnered from experience gained in the last war, and most of the gas attacks then were carried out over a limited distance from the front line, with few animals within range and with still fewer people having either the time or skill to study the clinical symptoms or conduct *post-mortem* examination on any cases which were in the contaminated area.

From the point of view of the veterinary practitioner, the war gases can be divided into three groups.

1. Tear gases and lung irritants.
2. Those containing arsenic.
3. Mustard gas.

(1) *Tear Gases* have no effect on animals. *Lung Irritants* probably have much the same effect as on human beings—coughing, spasm of the throat, and finally the usual signs of pulmonary oedema.

The veterinary surgeon will have to decide quickly whether he thinks the animal will develop severe lesions or not. If the former, he ought to order it to be slaughtered since if the offals, etc., are discarded the remainder of the flesh will be edible, provided there are no signs of congestion or general systemic poisoning.

(2) *Arsenical Gases* are the nose irritants—Arsine, Lewisite, Dick and Methyl Dick. These will all produce arsenical poisoning as well as their irritant effects. In the case of the *nose irritants* we have no idea whether the train of symptoms will be the same as in man, but it is evident that if the animal breathes in enough of these very lethal gases it will eventually suffer from arsenical poisoning. *Arsine* is unlikely to be used against civilians because of the technical difficulties involved, so that there is little likelihood of animals suffering from it. The arsenical *vesicants* must be treated both for arsenical poisoning and for the burns likely to be produced.

The carcases of livestock effected by the arsenical gases *cannot* be salvaged for food. Therefore the veterinary practitioner is in no dilemma regarding whether or not he should endeavour to treat the animals. The actual site of the liquid splashes must be treated as quickly as possible in order to prevent arsenical poisoning. It is to be hoped that before long veterinary practitioners will be informed of the latest and best methods for accomplishing this.

(3) In the case of *Mustard Gas*, the animal may suffer from the effects of vapour or liquid contamination. If the former, the animal will show the usual eye lesions and if seriously affected ought to be treated by irrigation, etc. If lung symptoms develop

*Presented to the Scottish Metropolitan Division, N.V.M.A., at Edinburgh, March 22nd, 1941.

or if inflammation of the digestive system is diagnosed the animal should be killed and the carcase salvaged as in the case of lung irritants. If the animal has been heavily splashed with mustard gas liquid the veterinary surgeon must quickly decide whether he will try to treat the animal by washing with soap and warm water and apply bleach either in wash or ointment form, or whether he will kill the animal immediately and try to salvage the carcase. There is no reason why the meat should not be salvaged. The flesh underlying the lesion should be cut away and the offals discarded. The remaining meat will be edible.

There is another problem with which a veterinary practitioner might be confronted at a date remote from the actual occurrence of a gas attack. Gas bombs may be dropped in fields of growing crops which will later be used for animal fodder. In the case of mustard gas, if the weather is bright and warm and/or there is much heavy rain, the gas will be quickly rendered harmless provided sufficient time is allowed to elapse before the crop is gathered. Where arsenical gases have been used there will be danger of serious contamination especially if these gases have been used to such an extent as *not* to destroy the crop completely. The farmer may decide to try and save the crop for fodder and cases of arsenical poisoning may arise amongst the animals fed. The veterinary surgeon should be on the lookout for such cases on farms where gas attacks have taken place. If he is consulted as to the advisability of using such fodder he should suggest that a sample of the fodder be sent to a public analyst for arsenic assay.

I hope that I have made the veterinary surgeon realise that he has a problem to face if gas is used. How is he going to face it? He arrives on the farm at the behest of the farmer, but probably after the various A.R.P. services have departed, so that he has no means of accurately deciding which was the gas used unless he has already arranged some liaison with his local A.R.P. services. In areas where the National A.R.P. for Animals Committee is strongly represented the matter is simple since this organisation can be his connecting link to the other services. In some districts N.A.R.P.A.C. officials have already made all arrangements to deal with gas casualties in intimate collaboration with the Ministry of Home Security. This is as it should be, and we hope for even closer co-operation in the future.

In districts where N.A.R.P.A.C. has not yet become fully linked up with existing civil defence organisations, I suggest that the veterinary practitioner should get in touch with his local A.R.P. Controller in order that he can avail himself of any local anti-gas training which is being held. He should become fully conversant with gas in all its aspects. Then, and only then, can he tackle his own gas problems in a confident manner.

I should add that once the salvaged carcase reaches the meat market all the necessary arrangements have been made between the Ministry of Food and the Chief Meat Inspector of the burgh or county regarding decontamination and the other procedures necessary in the case of such salvaged food. Still, the onus of deciding *on the farm* which carcase might be salvaged will be on the practitioner, and by making wise and accurate decisions he will be helping the National Effort by conserving the food supply of the people.

Discussion

Mr. A. Gofton, who opened the discussion, first thanked Dr. Stewart for a very interesting address: he had put the facts before the members in a way which would make them appreciative of the problems likely to arise. There were, however, one or two points he would like to emphasise.

From the meat inspector's point of view probably the most important group was that of the arsenical gases. In the event of one of these being used, the veterinary surgeon would have to decide whether to treat the animal or to slaughter it. But in the latter case, in judging whether or not the carcase could be passed for food, he must keep in mind the risk from absorbed arsenic. In regard to other gases, such as mustard or the lung irritants, if the veterinary surgeon decided that treatment was not advisable and recommended slaughter, salvage would be possible in some cases. With the lung irritants the really dangerous effects of the gas might not be obvious at once. The animal might appear quite well for some hours after exposure and later develop serious lung lesions which might prove fatal. In connection with poisoning with lung irritants, the official recommendation was that the carcase be passed provided there were no signs of congestion. He wondered what was meant by that? Did it mean that the carcase had bled badly, or that there was congestion of the lungs or some of the other viscera, or what?

With mustard gas difficulty would arise in handling an animal contaminated with liquid. If one had to deal with a sheep whose fleece was soaked with vesicant liquid, there would obviously need to be some decontamination before the carcase could be dressed. Before dressing could proceed the carcase would have to be removed from its contaminated surroundings to a reasonably safe area. On farms, water supply and drainage for the safe disposal of washings from the contaminated fleece would have to be considered. Then there was the difficulty which the slaughterer would encounter in attempting to work in anti-gas clothing. The type of glove normally provided was obviously quite unsuitable for skinning and handling carcases.

With regard to mustard gas, it was officially recommended that the parts affected or damaged could be removed and the rest of the carcase passed. Did that mean those parts immediately underlying the areas of skin which had been soaked with liquid?

Fat would absorb and hold mustard gas and, if the process of dressing was carried out in an atmosphere not free from gas, there would be some contamination of the carcase by vapour. The veterinary surgeon had, therefore, many points to consider in deciding what action to take if presented with the problem of preparing an animal soaked with mustard liquid, so as to ensure that the major part be passed for food and yet avoid undue risk to himself and his assistants.

Mr. Hillock, having also expressed his appreciation of Dr. Stewart's address, said that he was glad Dr. Stewart had brought up the point about liaison with the official A.R.P. services. He drew attention to the Defence Regulations 79a and 79b, which clearly described the close contact required between police and veterinary surgeons, the "approved organisation" by the Ministry of Home Security being N.A.R.P.A.C.

Speaking for his own area, he could say that in East Lothian they had done everything possible in the way of co-operation with Civil Defence Services, and he felt that they had evolved a good practicable rural scheme. [With the aid of a map Mr. Hillock then gave a

detailed description of the N.A.R.P.A.C. organisation in East Lothian.] He agreed with Mr. Gofton that it would be a difficult job to deal with sheep whose fleeces were soaked in liquid blister gas. Decontamination by hosing was obviously extremely important, and for that they would enlist the aid of the Fire Services if necessary.

With regard to incendiary and high explosive bombs, or any other weapon of destruction, they were prepared to do their utmost to counteract them to the best of their ability so far as animals were concerned.

Mr. Gofton said that so far they had been dealing with animals of utility to the community. They must not overlook, however, the danger of small domestic animals, contaminated with gas, running loose and uncontrolled and so endangering the human population. In the interests of public safety such animals should be destroyed, and powers were necessary to enable that to be done.

Mr. W. B. Robson, called upon by the Chairman to give a description of N.A.R.P.A.C. activities in Kincardineshire, said that he was not at all happy about the position with regard to decontamination of animals. Personally, he doubted very much whether this was the veterinary surgeon's job. In a gas attack on a farm it was quite possible that a number of animals might be affected and these animals would be difficult to handle without great risk to personnel. In his area he had enlisted the aid of the A.R.P. decontamination squads and, in the event of animals being affected, they were willing—subsequent to satisfying the calls of the human population—to assist in decontaminating animals and premises. He was particularly concerned about the congregation of animals at Collecting Centres of the Ministry of Food. Under such conditions some 200 or 300 animals might well be involved. What could a veterinary surgeon with one or two labourers do in such a case? At present, no practicable arrangement had been made for dealing with such large numbers. Personally, he thought that the onus should be laid on owners to supply themselves with stirrup pump and bleach and that they should be instructed in the use of the equipment, so that they could get on with the job immediately the need arose.

At one railway centre personnel had been appointed and trained in the use of equipment, so that they could deal with the decontamination of horses. He felt that something on these lines should be done by animal owners.

The Reply

Dr. Stewart, in replying to Mr. Gofton, said that he agreed that anti-gas clothing was very clumsy, but constant practice led to great improvement. If the Gas Identification Service could perform delicate chemical tests with the gloves on, it should not be beyond the powers of a slaughterman to dress a carcase. With practice he thought they would find the oil-skin gloves much easier to work with.

As regards Mr. Gofton's question about the amount of a mustard contaminated carcase which would have to be removed, it was probably only the parts immediately underlying the contaminated skin which would have to be cut away, though he expected they would allow a large margin. There the skill of the meat inspector would come in. If he were not satisfied regarding the carcase, he should insist on a chemical analysis of parts by a Public Analyst in order to determine the actual degree of contamination.

The question of congestion had been raised. This was merely used as a term to indicate that the animal was suffering badly from the effects of the gas. If the whole system was upset, he doubted whether such an animal should be used for food.

The insidious nature of lung irritants had been mentioned and he agreed that this was one of their worst features. Any animal coming within range of phosgene gas should be given rest and kept warm. That was an important reason for liaison with the authorities—so that the veterinary surgeon might have rapid and accurate information about gas incidents.

He was interested in the scheme outlined by Mr. Hillock and was glad to see that one county, at least, was taking active steps.

He agreed with Mr. Robson that decontamination of animals on the farm was not the veterinary surgeon's job at all. He felt that something after the same style as the cleansing stations attached to First Aid Centres for humans might be devised. It should not be impossible to provide a few large dipping baths filled with bleach and to pass animals through them, but it was difficult to arrange any practicable scheme. It was unfortunate that N.A.R.P.A.C. was not under the Ministry of Home Security, as no official plans had been made and no Government funds were available for supporting any scheme. He suggested that N.A.R.P.A.C. should agitate for an official policy being worked out at once.

Report on the Biological Urine Test for the Diagnosis of Pregnancy in the Mare

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A pregnancy diagnosis service for the mare has been in operation in Kenya for some years. This report, which presents and discusses the results obtained during the five breeding seasons from September, 1935, to August, 1940, confirms previous work on the value and accuracy of the biological urine test.

The test is based on the excretion of oestrogens in the urine, and, because oestrogens appear in the urine of the mare not only during pregnancy but also under certain other conditions in the non-pregnant mare, the test is a quantitative one. The technique employed differs in no way from that previously in use and will not therefore be discussed.

The essential features in the recognition of pregnancy in the mare by this test are the demonstration of the diagnostic concentration of oestrogens, *i.e.*, 1,100 m.u. per litre of urine in the period up to 100 days after the last service, and after this period, the demonstration of the approximate concentration of oestrogens that is to be expected at a particular stage of pregnancy.

Since 1936, about 70 mares have been tested each breeding season. The results are shown in the following Table.

Pregnancy Tests, 1936-1940

	Pregnant.	Non-pregnant.	Doubtful.	Errors.	Total.
Mares	187	145	7	4	343
Tests	232	196	9	6	443

The doubtful results were obtained from mares which excreted less than 1,100 m.u. oestrogens per litre of urine and because further specimens were not submitted, a definite diagnosis could not be made.

The accuracy obtained with this test was high. Four mares out of a total of 343 (*i.e.*, 1·2 per cent.) were incorrectly diagnosed as pregnant. The errors were all in the non-pregnant mares and the percentage error in these mares was 2·8. One of these errors was due to faulty technique ; urine when injected into mice that had been in use for nearly a year showed an apparent concentration of 1,100 m.u. oestrogens per litre, but a retest of the same specimen on new mice showed less than 830 m.u. to be present. The subsequent history of this mare and further pregnancy tests

showed that she was not in foal. An error of this nature can be avoided, but the three other errors fall into a different category, for the diagnostic concentration or greater quantities of oestrogens were demonstrated in mares which subsequently proved to be not in foal. These three non-pregnant mares gave 1,100 m.u. at 69 days after service (mare C), 1,330 m.u. at 81 days (mare R) and 1,660 m.u. at 76 days (mare B) respectively, and were accordingly diagnosed as in foal. Subsequent tests on two of these mares at 187 and 290 days respectively gave negative results. There are two possible explanations for these errors, (*a*) that the mares were actually in foal at the time of test and subsequently aborted (improbable in the case of one mare) and (*b*) that the mares were affected by cystic ovaries and excreted abnormal amounts of oestrogens. From available breeding histories of these mares, mare C failed to foal in the seasons preceding and subsequent to that of the test in question ; mare R failed to foal in the subsequent season and mare B foaled in the two subsequent seasons. The results from these three mares represent the only real errors in the test in the period under review. With the procedure at present in use, such errors are unavoidable, but they are so few that the value of the test is not affected.

Pregnant Mares.—The period of pregnancy at which the diagnostic concentration of oestrogens occurred varied considerably and because amounts of oestrogens smaller than the diagnostic concentration may be excreted, more than one test may be required to establish the presence or absence of pregnancy. An average of 1·2 tests was required for pregnant mares. Thirty-six mares out of a total of 187 pregnant mares required retests, *i.e.*, 19·3 per cent. For the period of pregnancy, 61 to 100 days, 23 mares out of 108 required retests, *i.e.*, 21·3 per cent. The following table shows that the number of mares that gave less than the diagnostic concentration of oestrogens fell as the stage of pregnancy advanced from 60 to 100 days.

Period of Pregnancy in Days.	Number of Mares Tested.	Mares giving less than 1,100 m.u.	
		Number.	Per cent.
41–50	11	9	81·8
51–60	13	4	30·8
61–70	30	10	33·3
71–80	30	9	30·0
81–90	27	3	11·1
91–100	21	1	4·8

It was exceptional for a positive diagnosis to be made before the 50th day of pregnancy. From the 51st to the 80th day about one-third of the pregnant mares required retests. After the 91st day a retest was exceptional.

The fact that it was possible to make a positive diagnosis in nine of thirteen mares tested between 51 and 60 days of pregnancy suggests that specimens of urine might be submitted for diagnosis as a routine measure at this period. The argument against doing so, however, is that a pregnant mare may not excrete oestrogens in amounts detectable by the test as late as 58 days after service. When an early diagnosis is desired a test may be made 51 to 60 days after service, but a completely negative result is inconclusive, as the mare may be in foal and in such cases a retest is necessary.

Thirty pregnant mares were tested 61 to 70 days after the last service and all without exception excreted oestrogens, varying in amount from 330 to 1,660 m.u. per litre of urine. Because a pregnant mare always excretes detectable amounts of oestrogens from the 61st day of pregnancy, but may not do so up to the 58th day, it is advisable for routine conduct of the test, that specimens for diagnosis should not be submitted before 60 days after the last service.

Non - Pregnant Mares. — Sixteen non - pregnant mares tested 61 to 70 days after last service gave completely negative results, which confirms the view previously expressed that a negative result at this period indicates the absence of pregnancy.

Twenty-six non-pregnant mares out of a total of 145 non-pregnant mares (17·9 per cent.) excreted from 330 to 830 m.u. oestrogens per litre of urine. In addition, three non-pregnant mares, which gave erroneous results, excreted from 1,100 to 1,660 m.u. Fifteen non-pregnant mares out of a total of 43 non-pregnant mares (34·9 per cent.), tested 61 to 100 days after service, excreted from 330 to 830 m.u. oestrogens. These 43 mares, tested 61 to 100 days after service, required 58 tests, *i.e.*, 1·3 tests per mare, to establish the absence of pregnancy. Later than 100 days after service, the finding of only 830 m.u. oestrogens per litre of urine is sufficient indication of the absence of pregnancy.

DOMESTIC PRODUCTION OF ERGOT

Ergot is one of the drugs which the recent Memorandum by the Medical Research Council recommended for production in Great Britain. That it could be grown in this country and with little danger of infection of cereals other than rye is an established fact, and it would seem that Western England and Wales would provide the most suitable localities for its production.

The question whether it is desirable to embark upon British cultivation on a commercial scale is, however, another matter. At the present time supplies of ergot imported from Portugal are sufficient to meet the needs of the London market, and actually prices are not higher than they were before the war. It is by no means unlikely that for the want of buyers substantial stocks have accumulated in Spain and Portugal, and possibly in Russia and Poland. Sooner or later these stocks will be released, and in the meantime, as we have just seen, there is no immediate shortage of supply in Great Britain. While it may be well to prepare plans to make Great Britain independent of outside sources of supply it may be that when the time comes to proceed with field cultivation the supply position will be no less favourable than it is to-day.

We are informed that the question of selection of the species and strain of the fungus is receiving the attention of experts, who are seeking strains of high alkaloidal content. It is interesting to recall that publications from the Pharmacopoeia laboratory have indicated the possibility that the standards of the Pharmacopoeia will be eventually altered, and in this connection it may be noted that much of the information concerning the alkaloidal content dates back to a time before the discovery of ergometrine. Chemical methods of analysis for determining water-soluble alkaloid (ergometrine group) and water insoluble alkaloid (ergotoxine group) have been devised, and it would be advisable to control cultivation experiments on this basis. Taking the long view, it may be that the wider spaces of the British Empire overseas are more suitable for the cultivation of ergot than western England and Wales. Already in New Zealand the production of *Festuca* ergot is being developed, the species of fungus which grows on Festuca being highly esteemed as a source of ergotamine.—*Pharm. J.*

Economy in the use of Drugs in War-Time*

The Medical Research Council has now published its Memorandum under the above title. Its Therapeutic Requirements Committee has Professor G. H. Wooldridge as one of its members and it was a draft of this publication to which reference was made in our issue of February 15th. It was, in fact, a regrettable error which led to this publication, for publicity should only have been given to the Committee's deliberations when they had reached their final form. We much regret any inconvenience which our error may have caused and would offer our apology to Professor Wooldridge in particular.

In this connection we have received certain correspondence regarding the communication which the Association addressed to the Secretary of the Medical Research Council on this subject. It has been pointed out that the suggestion that Bromethol be omitted from the list had evidently been made without appreciation of the fact that it is identical with Avertin, which is used by many veterinary surgeons. The suggestion that there was no need to include Suprarenal Cortex Extract since Adrenalin was already in Category A, must have arisen from some misconception or mistake, since, of course, this extract does not contain Adrenalin.

The list of drugs which appears in the Memorandum differs somewhat from that which we printed but pressure of space prevents our giving full details. We would recommend to those interested a careful study of the Memorandum. It may, however, be mentioned that the mistake in the original draft which recommended the reservation of linseed oil for external use in veterinary practice has been altered and that the Committee adhere to their discouragement of liquid paraffin. This is one of the preparations which is under Government control and the profession must accept the position and encourage the use of preparations which have a similar therapeutic effect.

The profession will probably realise that the Therapeutic Requirements Committee had an unenviable task. In these days, when a multiplicity of names is often attached to the same product, it is indeed difficult to sort things out, as is evident by the confusion which apparently arose as to what Suprarenal Cortex Extract really is, and even the committee must have missed naming some of the substitutes, for it has been pointed out to us that the substance originally named Acaprin is now offered to the profession under other names than the one chosen by the committee, Pirevan. We have little doubt but that certain preparations will, in accordance with the recommendations, be available only in very restricted quantities and we know that the profession will loyally accept such restrictions and find substitutes for materials now almost "banned."

An appendix to the Memorandum makes the recommendation that the production of certain drugs should be encouraged in the United Kingdom and the British Empire.

*M.R.C. War Memorandum No. 3. H.M. Stationery Office, price 3d.

"Jimmie," a typical dales-bred pony, has died at Glaisdale, a North Yorkshire moorland village, at the age of 48 years. He had been living in retirement for nearly 20 years.

CLINICAL COMMUNICATION

A Strange Manifestation of Anthrax

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DALKEITH

The following case is recorded because it presents several unusual features.

Subject.—An Ayrshire cow which had just calved its third calf.

History.—For a week or ten days prior to calving she had shown signs of capricious appetite and had been grinding her teeth. Little notice, however, was paid to this as she was very heavy in calf. The opinion was expressed that she was either carrying twins or an exceptional calf, and that so much room was being taken up in the abdomen by the uterus that she was quickly satisfied, and was possibly caused some discomfort.

A big bull calf was born at 5 a.m. on February 4th, 1941; the membranes were expelled at 7 a.m., and at 5.30 p.m. when the dairymaid finished milking, the cow appeared to be quite normal. The dairymaid looked into the byre at 9 p.m. and found the cow breathing heavily, restless, paddling and inclined to lie. Assistance was then sought as it was thought that she might have milk fever.

Symptoms.—On examination the respirations were accelerated, and on auscultation there were sounds on the lungs suggestive of congestion. The respirations were 22 to the minute, the pulse 92, and the temperature was 103° F. Normal faeces were found lying behind the cow. When asked to rise she did so with little difficulty. The dairymaid reported that the cow had been "putting out her calf bed," but that she had managed to get it back again. At this point the cow began to strain, and the *os uteri* was prolapsed. With this, slight signs of pain were noticed and the cow alternately rose and lay down. More normal faeces were voided at this stage.

It was decided to apply a truss to keep in the *os uteri* and the cow rose willingly again. The only reasonable rope about the place was so hard that it was difficult to make the knots, and with the delay the cow lay down again and it then would not rise. The truss was therefore not applied, but tapes were inserted in the lips of the vulva in the usual way.

Though the case was not typical of milk fever she was treated with calcium borogluconate solution, and then put into a comfortable position. In a short while the breathing became slower and rather stertorous and straining stopped.

The case was left about 10.30 p.m., and next morning to my great surprise I received a telephone message to say that the cow died at midnight. The death being so sudden, and no signs of internal haemorrhage being apparent when I left, it was decided to report the case to the local authority as suspected anthrax. A veterinary officer of the Ministry of Agriculture later diagnosed the case as such.

The unusual features noticed were :—

(1) The long preliminary period of digestive disturbance.

(2) The low temperature at a time so near to death.

(3) The absence of blood except on the prolapse, in fact the normal appearance of the faeces.

(4) The presence of some features resembling milk fever.

There has never been a case of anthrax on this farm before.

The cows on the farm were being fed on linseed, beans, hay, straw and mangolds, all grown on the place. The mangolds were grown on lea that had been ploughed late, and as the grass had not had time to disintegrate the land was manured with bone meal and other fertilisers. The mangolds were very dirty when lifted and in my opinion this is probably how the infection reached the cow. It is regretted now that this food was not sent for bacteriological examination.

How different the above story would have appeared if the case had not been notified, and yet on the history no one could have been blamed for sending such a carcase straight to the knackery.

A Sequel

A sequel to the above case occurred on the same farm four days later.

On February 8th last year's calf from the above cow was showing the preliminary symptoms her mother showed, shivering, grinding the teeth and not eating. The temperature was 106·2° F. The only opinion that could be expressed now was that the case was suspicious of anthrax as the calf had been getting the same feeding, and was standing in the next stall to her mother. It was also admitted that it might be " chill," as she had been going outside for a little exercise. In order to try and differentiate the two conditions 10 c.c. of S.U.P.36 was given deep into the gluteal muscles.

On the 9th the temperature was 104° F., but no other change could be detected. It was noticed that the faeces were normal, but they were being passed in less quantities and at infrequent intervals. All the concomitants of fever were present, but at no time in the course of the disease was there any evidence of pain.

On the 11th, two days later, the temperature had risen to 107° F., and for the first time it was noticed that there was a little oedema in the jowl and this oedema increased over the next two or three days until it was easily noticeable.

On the 11th the heifer was notified as suspicious of anthrax. No films were made, however, as instructions were issued against that procedure because it would lead to the spilling of blood, and in any case organisms might not be found as they only appear in the blood a short time before death.* Moreover, if the heifer had proved to be positively suffering from anthrax,it could not be slaughtered, but would have to be left to die.

At this stage the faeces were still being passed in the small infrequent amounts, and the dairymaid was asked to watch for blood in the faeces. On the 14th blood was passed in clots and streaks, together with a large quantity of a mucoid material—in fact there was no real faecal material. Some of these clots were sent for cultural and microscopical examination, but they proved to be negative.

On the 15th a mass was passed which looked at first like a cast of the bowel or a voided intussusception. This measured about six inches by two inches, and on closer examination proved to be a mass of consolidated mucoid material. It was friable and easily teased out.

On the 16th the heifer began to improve and was eating hay in small quantities. The faeces were passed frequently, were extremely thin—very little more than watery—and of a dirty grey-green colour. There was grinding of the teeth, with chewing movements and the issue of a considerable amount of froth from the mouth. The heifer continued to eat and improve and on the 18th a blood stain about the size of a tram ticket was discovered on the side of the upper lip, but it was not possible to decide whence this blood came.

On the 24th the temperature was normal, and the heifer seemed to be well past the worst, but that night she suffered a relapse, showing a subnormal temperature and a very distressed attitude, and looking as though she would die in the night.

On the 26th the bedding was again soaked through and through with the thin, watery, mucoid material which in some places was blood stained. No trace of definite faecal material could be found.

The heifer then began again to improve and was eating hay with great relish. She improved rapidly from this point, and on clinical examination, she appeared normal in every way. The faeces were normal in quantity and also in consistence.

On March 11th she refused her food in the morning, and clinical examination failed to reveal a definite cause. She was given no medicines, and in the afternoon was eating all her food and was seemingly perfectly healthy.

She was seen as a matter of interest at the end of March and found quite normal in every respect.

I do not wish to infer that the above case was one of anthrax, but I consider it very suggestive and worthy of record.

* As reported in this journal (Feb. 3rd. 77. 1940) *B. anthracis* does sometimes invade the blood stream as much as 30 hours before death. In such cases as the second one described above, it would have been interesting to know if it had done so, despite subsequent recovery.—*Editor.*

ABSTRACTS

[GRASS DISEASE IN A COAL MARE. Forsyth, A. A. (1941.) *Vet. J.* **97**. 26.]

An account of an outbreak of grass sickness in a colliery in June, 1927, in which ten animals died with typical acute symptoms and one recovered after prolonged treatment. Investigation suggested that the outbreak may have been associated with a particular consignment of hay. The animal which recovered has since been worked continuously and has remained in good condition, though with a tendency to constipation which has had to be guarded against continuously. A. R.

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[THROMBO-ANGIITIS OBLITERANS IN A HORSE. Innes, J. R. M., and Whittick, J. W. (1940.) *J. Path. and Bact.* **50**. 377-381.]

The description of a case of obliterating vascular disease of the terminal aorta and hind limbs in a horse which was free from intravascular strongyle infestation. The pathology of the condition was identical with that of Buerger's disease of man (thrombo-angiitis obliterans). No previous record of the occurrence of this disease in the domestic animals has been given and its possible association with intermittent lameness in the horse is noted. W. M. H.

[PERSISTENT THYMUS IN MILKING COWS. Forsyth, A. A. (1941.) *Vet. J.* **97**. 29-31.]

Three cases are recorded of this seemingly rare condition. In the first the thymus was situated anterior to the first ribs and ventral to the trachea. There was no other apparent cause of death and the author suggests an analogy between this and the so-called *thymus lymphaticus* of man. In the other two cases the gland was situated in the anterior mediastinum. There was a marked effusion of lymph-like fluid into all the serous cavities and death was presumably due to pressure of the fluid on the heart and lungs. The animals were in good bodily condition and death was sudden in each case.

C. W. O.

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[PLASMA ALKALI RESERVE IN THE DOMESTIC FOWL. Common, R. H. (1940.) *Nature, Lond.* **146**. 98-99. (7 refs.).]

The plasma alkali reserve of a group of White Wyandotte pullets receiving a low calcium ration was found to lie between 58 and 66 vol. CO_2 per cent., and was not noticeably affected by the onset of laying. In a group of pullets receiving the same basal diet together with 5 per cent. of calcium carbonate, the plasma alkali reserve rose to as high as 88 to 89 vol. CO_2 per cent., and remained high during the laying period, although there were indications that heavy laying tended to reduce the levels. The plasma alkali reserve of a single cock bird remained between 62 and 69 vol. CO_2 per cent. whichever ration was fed, from which fact it is concluded that the high values obtained with the pullets on the ration rich in calcium may be ascribed to female reproductive activity.

It is suggested that when the calcium carbonate intake during the pre-laying period is sufficient, there is an adjustment of the blood acid-base equilibrium in association with calcium storage, so that there is a higher Ca/P ratio in the newly deposited bone than in the skeleton as a whole. There would thus be readily available material for shell formation.

[The term " plasma alkali reserve " refers to the amount of base in the plasma which is combined as bicarbonate. It is upon the amount of alkali available that the CO_2-combining power of the blood depends. The bicarbonates afford a readily available source of base for the neutralisation of stronger acids. Marked decreases or increases in the alkali reserve lead to " acidosis " and " alkalosis " respectively.]

A. N. W.

Weekly Wisdom

Matter in a state of absolute rest, were such a thing possible, exhibits no properties in particular . . . impart vibrations to its molecules however, gradually increasing the rate, and what happens? Firstly the formation of sound, rising from the lowest to the highest audible notes; becoming heat as the rate increases, from invisible or black to visible heat or light without heat, through the intermediary stages of red to white into that region of ultra-violet or invisible light, on and on into still more rapid vibration until electric and magnetic waves make their appearance manifest; it may be that as the rate still further increases phenomena are developed, the presence of which we have as yet no senses for recognising, or instruments sufficiently delicate to detect.—A. H. Avery.

IN PARLIAMENT

The following are among the questions and answers recently recorded in the House of Commons:—

Military Service (Slaughtermen and Fellmongers)

Mr. Haslam asked the Minister of Labour whether, in view of the importance of getting dead animals, killed either by accident or enemy action, removed from farms, and of the specialised nature of this occupation of slaughterer and fellmonger, he will consider making such occupation a protected one in cases where in rural areas there is only one such man in this occupation?

Mr. Assheton: Slaughtermen and fellmongers are reserved at 25: but applications are considered for the deferment of the calling-up of men below that age who are engaged on work of public importance and who cannot be replaced.

FOOT-AND-MOUTH DISEASE

There have been 79 outbreaks of foot-and-mouth disease in Cheshire since January. The latest outbreaks have occurred on premises at Huxley, Great Mollington, Bunbury and Nantwich.

Announcing new outbreaks on April 14th, the Department of Agriculture, Eire, said the fact that cases were still occurring showed that the position continued to be serious. The recurrence of cases in districts already infected indicated that sufficient care was not being exercised in preventing and avoiding contact with infected premises. Appeal was again made to the public to avoid entry on lands or premises in danger zones.

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BENEVOLENCE

It was with much pleasure that we received recently from the Hon. Secretary of the North of England Veterinary Medical Association an intimation that he had forwarded to Dr. Bullock a cheque for £44 6s. 0d., being the result of a special appeal on behalf of the Victoria Veterinary Benevolent Fund. The sum represents the following:—

	£	s.	d.
Special donation from the N.E.V.M.A. ...	10	10	0
Result of special appeal on the occasion of the Annual General Meeting	23	16	0
Ladies' Effort	10	0	0
	£44	6	0

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Windermere fishermen are going fishing for pig food. Four hundred steel wire-netting traps are to be set for the teeming millions of small perch in the lake. The fish will then be taken to Kendal and manufactured into pig meal. The scheme, approved by the Ministry of Agriculture and Fisheries, is the idea of the Freshwater Biological Association, which carries on research on the lake's western shore under the guidance of Dr. E. B. Worthington.

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It is reported that the Minister of Food has been asked to ration meat for dogs. Because of the extreme difficulty in providing dogs with meat from the table hundreds of dog-foodshops have sprung up in various parts of the country, many of them selling cow meat coloured green to show that it is unfit for human consumption. If all of these cows had to go to the Government slaughterhouses those not condemned could be made available for human food as manufacturing meat.—*Meat Trades Journal.*

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

May 9th.—Meeting of the Society of Veterinary Practitioners at Oxford, 2.30 p.m.
May 14th.—Meeting of the Lancashire Veterinary Association at Liverpool, 2.30 p.m.

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JOINT MEETING OF THE N.V.M.A. AND N.F.U.

Our readers will be pleased to learn that on Tuesday, April 8th, 1941, representatives of the National Veterinary Medical Association attended a joint meeting of the Diseases of Animals Committee and the Emergency Committees of the Livestock and Milk and Dairy Produce Committees of the National Farmers' Union to discuss the scheme submitted by the Association to implement the recommendations made in the Report—Diseases of Farm Livestock—as subsequently amended and agreed at the Conferences of the Ministry of Agriculture, the Ministry of Health, the Agricultural Research Council, the Medical Research Council and the National Veterinary Medical Association.

The Association was represented by the President (Mr. H. W. Steele-Bodger), Professor T. Dalling, Mr. G. N. Gould, Mr. G. P. Male, Professor W. C. Miller and Dr. W. R. Wooldridge.

Mr. C. Nathan and Mr. D. A. E. Cabot were also present.

After discussion, the Chairman (Mr. H. German) stated that the National Farmers' Union were prepared to co-operate with the Association in an endeavour to control the diseases outlined in the Report, and that the Union had appointed a sub-committee consisting of the President (Mr. T. Peacock), the Chairman and Vice-Chairman of the Diseases of Animals Committee (Mr. H. German and Mr. R. Russell Wood respectively), the Chairman of the Livestock Committee (Mr. G. Gibbard) and the Chairman of the Milk Committee (Mr. D. Gemmill) to discuss the details of the scheme with the Association.

The first meeting of this joint committee will take place on May 13th, 1941.

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Schedule of Reserved Occupations

The revised Schedule of Reserved Occupations includes veterinary surgeons and also veterinary students who have passed the first professional or equivalent examination.

This latter provision does not apply to students who have already been called up.

The reservation of students under the Schedule is subject to periodical certification of satisfactory progress in their studies.

Nothing in the Schedule prevents a man from undertaking part-time service in the Civil Defence Services, A.R.P. Service, or men of any age or in any occupation who volunteer and are suitable, from being enlisted as air-pilot or observer in the Royal Air Force or Fleet Air Arm.

Veterinary surgeons who fall out of employment for as much as a fortnight may be called up, and any veterinary surgeon may volunteer for general service subject to the recommendation of the Royal College of Veterinary Surgeons and the Ministry of Agriculture and Fisheries.

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PERSONAL

Birth.—On April 19th, to Mr. and Mrs. P. J. McCann, of Preston, a daughter.

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Marriage.—Henderson—Goodridge.—At St. Michael and All Angels', Pirbright, on April 24th, 1941, William MacGregor Henderson, B.Sc., M.R.C.V.S., to Alys Beryl, younger daughter of the late Mr. O. C. Goodridge and Mrs. Goodridge, of Worplesdon, Surrey.

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PETROL: NORTH MIDLAND AREA

Mr. Auchterlonie would like veterinary surgeons in his area to remember that applications for supplementary petrol sent to him must always be accompanied by the registration book. Failure to do this results in loss of time, extra clerical work and waste of stationery and stamps.

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R.C.V.S. OBITUARY

Clanchy, John T., Charleville, Co. Cork, Eire. Graduated N. Edinburgh December 21st, 1891. Died April 15th, 1941; aged 72 years.

Mr. John T. Clanchy, M.R.C.V.S.

Mr. John T. Clanchy, whose death we record above with much regret, was widely known, not only in Munster but throughout Ireland and in many parts of England as an outstanding judge of bloodstock; indeed, most of the important bloodstock purchases in Ireland on behalf of English and foreign clients were made through him.

Son of the late Mr. John James Clanchy, J.P., and grandson of the late Mr. Daniel Clanchy, D.L., both of Belfort, an ancestor of his, another Mr. John Clanchy, built the greater portion of the town of Charleville in the eighteenth century.

When the Irish horse-breeding commission sat in Dublin in 1935, Mr. Clanchy was the chief witness examined, and then he made a strong appeal to the Government to find money for veterinary research.

He was a well-known and popular figure at most of the shows and race meetings in the South. Perhaps the best horse he bred was Dan Bolger, which won the English Cambridgeshire in 1936, to complete a double with Fet, winner of the Cesarewitch, the most universally popular double of these handicaps for very many years. Dan Bolger was sold as a yearling at Ballsbridge for 340 gns. to Mr. H. Cottrill, the English trainer, and later in the colours of Sir A. Bailey he won the Cambridgeshire.

Mr. Clanchy leaves a widow, to whom deep sympathy is extended in her bereavement.

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GENERAL OBITUARY

Dr. A. Stanley Griffith

By the death of Dr. A. Stanley Griffith the veterinary profession has cause to mourn the loss of an earnest worker who devoted almost the whole of his working life to painstaking investigation of the types of tubercle bacilli and their exact distribution among the various animal species and became the recognised world authority on this subject. Collaborating as he did with veterinary workers from the early days of his classic work with the Royal Commission on Tuberculosis, many of his papers have been written conjointly with them and have appeared in the veterinary periodicals. Recently he entered into close collaboration with the staff of the Institute of Animal Pathology at Cambridge in evaluating the B C G method of immunisation for cattle, and the

outcome of his work there in collaboration with Professor Dalling on the possibilities of vaccination with the vole bacillus (see *Vet. Rec.* **52.** 740) was recorded in the December, 1940, number of *The Journal of Hygiene.*

The following obituary notice, in *The Lancet* of April 19th, aptly summarises his life work:—

"Dr. Stanley Griffith died in his sleep on April 9th at his home in Cambridge. He had just entered his 67th year and completed his first year of retirement from the service of the Medical Research Council. A graduate of the Victoria University, of which the Liverpool medical school was then a part, he qualified in 1897 and took his doctorate in medicine in 1901. He early showed his aptitude for the research in bacteriology to which he was to devote the rest of his life, his first work being at the Thompson-Yates laboratory from 1899 to 1902. When the Royal Commission on Tuberculosis started its experimental investigations in 1903, Rubert Boyce, as one of the commissioners, brought Griffith to join Louis Cobbett at Stansted, and there, on one of the commission's farms, he spent seven happy and fruitful years. The story of his ingenious and fertile labours is written in the commission's reports, volumes known throughout the scientific world as models of exact and careful statement, still standing unchallenged as to fact and convincing as to conclusions. The unwonted rashness with which Robert Koch proclaimed that bovine tuberculosis was harmless to man met its deserved penalty in Griffith's observations and the question has long ceased to be matter of controversy.

"But the *Mycobacterium tuberculosis* and its congeners among the acid-fast bacteria had still many secrets to yield and, when the Royal Commission dissolved in 1910, its purpose fulfilled, Griffith was induced by Sims Woodhead to transfer his laboratory to Cambridge as the nucleus of the field laboratories of that university. The transfer was a literal one, for the actual wooden sheds that had stood the weather already for seven years were re-erected on the site at Milton Road and have remained there ever since, the unassuming place of pilgrimage for tuberculosis workers the world over. Though the shack of the pioneer was soon overshadowed by the handsome buildings of the Institute of Animal Pathology, Griffith remained content with its modest sufficiency to the end. From 1911 to 1914 as Grocer's research scholar he continued the painstaking study of the natural history of the tubercle bacillus. In 1914 he entered the service of the Medical Research Council as a whole-time research worker and in this service he spent the rest of his working life.

"And a life work was necessary, for in no field of nature study, not even in plant and animal genetics, is patience more required than in the study of tuberculosis. Any experiment, whether on the cultural behaviour of the tubercle bacillus itself or on its effects on the animal body, may take months or years to give its answer. No short cuts are possible; the next step must ever wait with its foot long suspended, and knowledge grows like the growth of the stalagmite from long-spaced droplets through the years. The ingenious planning and the careful and continuous observation that are requisite can well be admired by bacteriologists accustomed to the rapid generations of other pathogens. Of the many technical inventions of which he was the author, the 'Griffith tube' for tissue emulsification will alone perpetuate his name.

"This is not the place for the full bibliography of Griffith's published papers, some 72 in number. They deal with tuberculosis as it occurs throughout the animal kingdom, with the effects of artificial immunisation on resistance to tuberculous infection, and with the sources from which human tuberculosis is acquired. A completed study of the bacteriology of lupus is in manuscript for publication in more settled times. The preparation of therapeutic serum for meningococcal infection and of anti-leptospiral serum for Weil's disease were occupations interpolated during the war years of 1914-18; both were of immediate and very great value.

"Though for many years Griffith was the judge of appeal in any disputed point in the biology or specific identity of acid-fast bacteria, he was scrupulous almost to a fault in giving credit to the less-experienced worker whose results were submitted for his confirmation. And nothing vexed him more than the inevitable tendency for others to ascribe to him as originator new knowledge which he had 'merely' had to test before it could be generally accepted. His distinguished services to science and on the joint committee on tuberculosis of the Medical and Agricultural Research Councils were recognised in 1939 by his appointment to a companionship of the Order of the British Empire. He was in 1927 the recipient of the Weber-Parkes prize and medal from the Royal College of Physicians."

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Dr. W. M. Scott

(Ministry of Health)

An Appreciation

In connection with the deeply regretted death, recently announced, of W. M. Scott, M.D., of the Ministry of Health, who was examiner in pathology to the Royal College of Veterinary Surgeons, a correspondent writes:

"The death of Dr. W. M. Scott as the result of enemy action has brought a sense of great personal loss to his wide circle of friends. He was one of the foremost medical bacteriologists in the sphere of public health and during the last few years, at the expense of his own leisure, had rendered conspicuous service to our profession as examiner in pathology to the Royal College of Veterinary Surgeons. As such he will be remembered by many of our younger graduates who cannot fail to have been impressed by the tact and consideration with which he filled that office. As a scientist he was very modest about his own achievements but others were quick to recognise his worth and had implicit faith in his findings. In consequence, many turned to him for help and advice which were always freely given.

The gentleness and essential goodness of his nature and his ready wit endeared him to all. One of the most sensitive of human creatures, he was a great connoisseur, able to appreciate and enjoy the good things of life but never daunted by adversity—rather was he willing to take the rough with the smooth and make the best of either. Recollections of happy journeys in his company now fill the mind; how he would enliven the way with quip and jest and anecdote or turn to admire the beauties of nature. And so he surely journeys on."

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STUDENTSHIPS FOR RESEARCH IN ANIMAL HEALTH AND VETERINARY SCHOLARSHIPS

The Ministry of Agriculture and Fisheries and the Department of Agriculture for Scotland will award one studentship for Research in Animal Health for the academic year beginning in October next. The studentship is to the value of £300 a year and is open to members of the College. Applicants must be nominated by one of the Professors or a Director of a Research Institute.

Applications on the prescribed form must be received not later than May 31st and which can be obtained from the Ministry of Agriculture, Lindum Hotel, St. Anne's, Lytham St. Annes, or the Department of Agriculture for Scotland, St. Andrew's House, Edinburgh, 1.

Instead of the above, a Veterinary Scholarship value £200 per annum may be awarded, tenable for not more than four years, to enable a graduate in science to obtain a veterinary qualification. Candidates must be eligible for exemption from the first veterinary examination.

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ROYAL SANITARY INSTITUTE

At the Annual General Meeting of the Royal Sanitary Institute held on April 25th, the Right Hon. the Earl of Bessborough was elected President of the Institute in succession to Lord Balfour of Burleigh, whose period of office had expired.

A STATE VETERINARY SERVICE

Some Facts and Figures

A correspondent writes as follows on the Governmental "ways and means" aspect of the question of the enlargement of the State Veterinary Service.

When considering the desirability of an enlarged State Veterinary Service certain members of the National Veterinary Medical Association have expressed some doubt as to whether the Government, in these troublous times, would or could give financial assistance to such a scheme. The following facts and figures compiled from Whitaker's Almanack for 1940 and other sources, but admittedly only approximate and relating to the year 1937-38 (later figures not being available), may prove of interest to your readers.

Lord Woolton has said, "So long as I have any voice in the matter, I will see that our dairy herds are maintained at all costs." It may be well, therefore, to consider the number of livestock which were in the country at the commencement of the war.

Livestock in the United Kingdom, 1937-38

Cattle	*Horses*	*Sheep*	*Swine*
8,000,000	1,000,000	25,000,000	4,000,000
	(Cows in milk 3,000,000)		

Estimated Value of Above

£155,500,000

It is interesting to note, also, that these animals were distributed among some 440,000 farms, over 200,000 of which were farms of under 50 acres, and 72,000 of over 50 acres and under 100 acres.

Number of Farms, 1937-38

1- 5 acres	England and Wales	64,000	Scotland	15,500
5- 50	"	"	"	166,000	"	33,500
50-100	"	"	"	62,000	"	10,000
100-300	"	"	"	66,000	"	12,000
300 and over	"	"	12,000	"	2,500
		Total	370,000		74,000
			Total	444,000	

In urging the farmers to greater efforts the Minister of Agriculture has recently said, "Unless we can get these changes and this *increased production* we shall not survive as a nation during the next 18 months." This increased production was necessary in order to make good the imports of food-stuffs which before the war were imported from overseas. The following table gives some idea of their nature and pre-war value.

Imports of Animal Products, 1938

Beef (Chilled)	cwt.	9,000,000		
" (Frozen)	"	3,000,000		
" (Tinned)	"	1,500,000		
" Total	"	13,500,000	Value	£28,000,000
Mutton and Lamb	"	7,250,000	"	20,250,000
Bacon	"	7,000,000	"	30,000,000
Pork	"	1,500,000	"	3,800,000
Hams	"	664,000	"	3,000,000
Animals live for food		1,000,000	"	9,200,000
Butter	cwt.	9,500,000	"	51,000,000
Lard	"	1,500,000	"	3,000,000
Eggs Numbers		3,324,000,000	"	12,000,000
Cheese	"	3,000,000	"	9,700,000
Milk (condensed)	"	1,634,000	"	2,400,000
Wool (raw and waste)			"	42,500,000
" (articles, yarns)			"	4,000,000
Animals not for food			"	3,000,000
			Total value	£221,850,000

But, unfortunately, our animals and their products are constantly reduced in quantity and quality by diseases due largely to the lack of veterinary supervision. Let us consider the direct and indirect losses caused by some of the principal diseases.

Losses Due to Diseases

Cattle (*Vide* N.V.M.A. Survey Committee's Report)	
Value of milk lost due to Mastitis	£3,000,000
" " " " Contagious Abortion	2,500,000
" " " " Sterility	7,000,000
" calves " " Mastitis	200,000
" " " " Contagious abortion	800,000
" " " " Sterility	600,000
Monetary loss due to replacements	3,000,000
	£17,700,000
Other Diseases of Cattle	
e.g., Foot-and-mouth Disease, Tuberculosis, Deficiencies, Johne's Disease, Anthrax, Quarter-evil, Verminosis, unknown diseases ... ... Say	2,300,000
Diseases of Other Animals	
Horses, sheep, pigs, poultry ... ... Say	5,000,000
Indirect Losses	
Loss of products, progeny, business, etc. Say	5,000,000
Approximate Annual Loss	£30,000,000

It has to be admitted that the above figure is purely hypothetical, but to avoid controversy it is a deliberate under-estimate. Owing to the lack of adequate veterinary supervision it is impossible to form an estimate with any degree of certainty.

As, however, Lord Woolton has expressed his determination that our dairy herds shall be maintained at all costs, and as the Minister of Agriculture has exhorted the farmers to produce within the next 18 months some 200 million pounds worth of animal products more than they could do in times of peace, the veterinary profession might be enlisted to assist in placing the pastoral industries upon a sound foundation, that is, a foundation of good health. For it is only the veterinary profession which, by reason of its training and practical experience, is qualified to carry out this all-important work. Unfortunately ours is a numerically small profession. According to the Register of the Royal College of Veterinary Surgeons for the year 1940 it numbered only 3,722 members, of whom over 800 are serving overseas or in the Army Veterinary Service. Of the remaining 3,000 some 1,000 are already engaged as whole-time or part-time officers of the existing Animal Health Division of the Ministry of Agriculture. There remain only 2,000 of whom, it is safe to assume, a large number are on the retired list and others profitably engaged in general or canine practice. Possibly there are another 1,000 suitable men who could be enrolled in an enlarged and reorganised National or State Veterinary Service. But the "labourer is worthy of his hire" and these could not be removed from their present source of livelihood without compensating remuneration. For purposes of discussion it may be suggested that, taking young and old, rich and poor, men of experience and proved ability and younger men new to the profession, an average of, say, £750 a year might be considered. Two thousand officers at £750 per annum each would cost the State £1,500,000, which, with £500,000 allocated to equipment, travelling and special subsistence allowances, would represent £2,000,000 per annum.

This, to the timid and humble, may appear a colossal sum, but if regarded as a war emergency measure represents less than one-sixth of what we are spending *per diem*. If we estimate the value of our livestock and animal products at £400 millions, and the losses due to disease at £30 millions per annum, this represents less than half of one per cent.—a very reasonable rate of insurance.

It is suggested that a National or State Veterinary Service, free to the farmers and remunerated entirely by the State, based upon the systems which have enabled our Dominions and Colonies to supply the greater part of the £220,000,000 worth of animal products now so urgently required of the farmers of this country, would go far towards resuscitating the pastoral industries and placing them on a more secure foundation for the future.

Scheme of Suggested National Veterinary Service

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[Since the foregoing was written the Minister of Agriculture has announced that, owing to the shortage of grazing and feeding-stuffs, unprofitable and diseased animals are to be eliminated. This is essentially work which should be entrusted to veterinarians, who are best qualified to avoid errors in diagnosis and unnecessary waste.]

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CANCER RESEARCH

The necessity for continued study and research if a cure for cancer is eventually to be found was emphasised at the annual general meeting of the governors of the Imperial Cancer Research Fund, held at the Royal College of Surgeons on April 17th.

Professor H. R. Dean, Vice-Chairman of the Council, who presided, presented the annual report, which included a statement by the Director, Dr. W. E. Gye, in which he said that tumours of animals, the material with which experiments must be conducted, were recognised as similar to human tumours only by the use of histological examinations. So long as it was impossible to demonstrate any definite material link between tumours of mice and men, or even between tumours of mice and rats, they were compelled to depend upon microscopic anatomy as a guide and control to investigations. For this reason histology was an indispensable part of cancer research.

Dr. Ludford, the statement continued, had made cultures of cells taken from pure line mice and had treated the cultures over varying periods of time. The cultures had then been grafted in mice of the same strain. More than 100 cultures had been inoculated with entirely negative results. The work was still in progress. There were grounds for hoping that the cure for cancer should some day be possible along Nature's own lines.

Referring to certain other experiments, Dr. Gye stated: "Thus we are left with the probability that some elusive anti-tumour-cell influence may be present and yet cannot be found by a method which at present would appear to be adequate. Evidently there exist means by which the body can cast out a malignant tumour composed of its own cells but which is too subtle in character for our present methods of investigation to discover."

The report stated that the Council had received with great regret the resignation from the chairmanship and from the Council of Sir Humphry Rolleston, who had rendered distinguished service to the Fund since 1924. The Council had elected him a Vice-President. An advisory research committee of five members of the Council had been instituted.

Professor Dean said that the report showed how splendidly Dr. Gye had met the difficulties arising out of the war, and how he and his staff had continued with the essential work of the fund, which was the discovery of the causes of cancer. Activity had been continued on the study of such substances as appeared to offer any possibility of arresting the progress of tumours. They had observed the circumstances accompanying the regression of tumours experimentally produced in animals, and any rare cases in which spontaneously produced cancer in human beings underwent regression. It was only by the study of the causes of cancer and the way in which the body was able to combat the progress of tumour growths that there was any prospect of discovering the causes of and cure for cancer.

Sir Holburt Waring, the Hon. Treasurer, presented the accounts, which showed a credit balance on the year's working of £1,152. The expenditure for the year was £13,498.

The report and accounts were approved, and a resolution was passed expressing appreciation of Sir Humphry Rolleston's distinguished services to the fund.

Lord Halifax was re-elected President and Sir Holburt Waring was re-elected Hon. Treasurer. Sir Cuthbert Wallace, Past President of the Royal College of Surgeons, was elected to the Council in place of Sir Humphry Rolleston.

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MINISTRY OF AGRICULTURE NEWS SERVICE

Hard Labour for Farmer's Neglect

Failure to Notify Foot-and-Mouth Cost Nation £125,000.—When foot-and-mouth disease was recently confirmed on a farm in Herefordshire, 29 cattle and 7 sheep were found to be affected with oldstanding lesions. Two pigs had also been slaughtered on the premises without notice being given to the Ministry of Food authorities. One of these pigs had foot-and-mouth lesions at least ten days old. The feet of the other pig were not available for examination.

In one case the farmer was given two months' hard labour by the Hereford magistrates for slaughtering the pig for human consumption without a licence. His negligence in regard to his other stock, including failure to see that swill was boiled before it was fed to his pigs, cost him £121 in fines and £28 for costs.

These penalties were severe, but the results of his neglect were far-reaching and serious. For subsequent tracing established the fact that this farmer's cows spread foot-and-mouth disease through Hereford market and the total number of secondary outbreaks attributable to this one initial case was 97, in six different counties. They cost the country approximately £125,000 in compensation. They caused 4,501 cattle to be slaughtered, 2,731 sheep and 948 pigs.

Marrow Stem Kale.—If the full benefit of the heavy yielding powers of this crop is to be obtained, it should be sown as early as weather conditions permit. Early sowings have the double advantage that they not only ensure the growth of the largest possible crop but also the crop is usually big enough to cut for green soiling in September, or even late August at a pinch. A further advantage of early sowing is that it gives the crop a chance to get established at a time when weather conditions are likely to be less suitable for turnip fly attack than later in the season. Early drillings in recent years have suffered frequently much less damage from turnip fly than later sowings, which have often had to be re-drilled as many as two or three times and then given only a poor plant. When working down a seed bed for kale it is also worth remembering that a fine seed bed helps to reduce the danger of serious flea beetle damage.

Marrow stem kale should receive liberal manuring. Few give a bigger response to dung and fertilisers, especially nitrogenous fertilisers. Dressings (including top dressings) of 3 to 4 cwt. per acre of sulphate of ammonia or nitro-chalk give big increases in yields, provided there is no serious deficiency of other plant foods.

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MEN OF SCIENCE AND THE WAR

The following article is reproduced from *Nature* because many of the statements made are apposite to the interest which the National Veterinary Medical Association has found itself forced to take through its Survey Committee in the application of veterinary science to the best possible advantage.

"Since the war, and in the months preceding it, it has been repeatedly urged in these columns that the times demand the maximum use of science and the full recognition by men of science of their social responsibilities. A year before the unstable international situation resolved itself into the present disastrous conflict, pages of *Nature* were devoted to statements by the scientific leaders of the country about the urgent need for scientific workers to undertake these responsibilities, but little of practical import has resulted so far. If the war succeeds in arousing certain men of science to a realisation of the social implications of their work, then it may be said that some good has come out of it, and it is to be hoped that such will be lasting. Men of science are proving invaluable at the present time; may their value still be recognised when the time for reconstruction comes.

"With the war, the country implicitly assumed a reorganisation so profound that the full realisation of its meaning only dawned in most minds after the disasters of Norway, Flanders and France, and with the victorious onrush of the German war-machine. To-day no persuasion is needed to impress on people the necessity for making all possibe use of the country's powers and resources. That message rings in our ears daily. But no efforts, however heroic, however widespread, and however energetic, will succeed in their objects without right direction—and such direction demands the full use of science.

"The Germans have demonstrated that this is a mechanised and technical war. It is not sufficient, therefore, for us to have limitless material resources; it is essential to use them in a thoroughly planned and integrated way. Until now (and this is still the case), planning has been the task of our political and industrial leaders and of the Civil Service alone. There is no need for us to dwell on the results of their efforts. As men of science our responsibility to-day is to see that things get done, not to blame others if they have not been done.

"The important part that men of science have already played in this war has been amply recognised in these columns. The Scientific and Research Departments of the Services, the Department of Scientific and Industrial Research and its kindred bodies, and the Medical Research Council, fortified as they have been by the addition of many academic men of science, have been fulfilling their appointed duties. But many scientific workers have not been used at all, and others, who have for long been in Government service, or who have been recruited since the war, are not being used to their fullest capacities. The fundamental reason for this (and this is the fudamental defect of the whole organisation) is that the functions of science have been generally conceived, to a large extent even by men of science themselves, in altogether too restricted a way. A general scientific point of view is foreign to the direction of the country, and in particular to its administrators. If this defect is to be remedied, men of science themselves must show the way. . . . In order to discover what are the urgent problems before us, and to determine their order of importance, it is first necessary to survey the whole field of national resources and national effort. This object will not be successfully achieved by administrative methods alone, and such methods so far constitute the only treatment of this particular question. They can lead no further than to a statement of the most apparent facts, whereas there is little doubt that a scientific approach would often reveal key problems, the solutions of which would advance matters more rapidly, and with less effort than any amount of energy directed along traditional paths. But if we are to achieve the best from a scientific approach to a fundamental survey of the problems before us. it is essential that the man of science should be given effective authority to make comprehensive inquiries, to formulate and to solve problems and, not less, to see that the solutions which he suggests are embodied in practical measures. . . .

"Since May, the circumstances for making full use of science have grown more favourable than ever before in the history of Great Britain. Complacency has given way to an acute appreciation of the fact that we have urgent unfulfilled needs, and failure has shown the inadequacy of traditional methods. Blame has very rightly been laid on administrators and industrial leaders for failing to achieve the desired results; but for us the lesson is rather in the failure of men of science to realise both the power that lies in their hands and the responsibility for using it. Men of science can no longer be complacent about neglect, or content with such notice as merely seeks their advice about particular issues. With few exceptions they have not regarded it as their duty to force on an unscientific administration their reading of the dangers and of the means for counteracting them. They have regarded their functions as served when their advice has been sought and given. It was not for them to see that it was acted upon. As 'J. S. H.' points out on p. 113, 'half the battle in science consists in asking new questions which the non-scientist cannot be expected to think of.'

"More than this is demanded to-day. 'Go to it,' in the words of the Government slogan, applies not only to the factory worker carrying out his routine duties. It applies even more to the scientific worker—demanding of him initiative, organising ability and drive, and the clear realisation that only with the help of these can the forces of reaction and inertia be turned aside, and our war effort rapidly brought to a successful end."

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PROPOSED LIVESTOCK EXPORT GROUP

Discussions are proceeding at the Board of Trade to form a livestock export group, which would organise an increase of British pedigree cattle, horses and polo ponies to America, the Argentine, South Africa and Malaya.

Despite Hitler's U-boats and long-range bombers, several consignments of our best breeding stock have safely arrived abroad since the war began.

An exceptionally large war-time shipment of 76 pedigree bulls went last month to Argentina. Sixty-nine of them were Shorthorns bought at the Perth sales in February, and their total value was estimated at £14,000. The other bulls were six Aberdeen-Angus and one Hereford.

Buyers when bidding had no idea how soon shipment could be provided, and the consignment was lucky to get away so promptly.—*Farming News.*